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Navin Kabra

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MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.

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EXAMINER

MESFIN, YEMANE

ART UNIT

PAPER NUMBER

2144

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/749,365	Applicant(s) KABRA ET AL.	
	Examiner YEMANE MESFIN	Art Unit 2144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/22/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The response filed on 12/26/2007 has been entered and made of record. New Claims 32-53 are now pending in this application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 32-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 32, Claim Line 4, Claim 46, Claim Line 7, and Claim 50, Claim Line 3, the inventive entity recites, “the remaining nodes”, which lacks proper antecedent basis. No “remaining nodes” was previously defined in the claim.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 32-45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 32 recite “A computer readable memory...” (See Claim 32, Claim Line 1). The computer readable memory medium is not limited to statutory subject mater. In view of Applicant's

disclosure, See Specification Page 43 ¶1, the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments [e.g., computer readable storage media, see Page 43 ¶1 “...medium may include storage media or memory media such as magnetic or optical media, e.g., disk or CD-ROM, volatile or non-volatile media such as RAM (e.g. SDRAM, DDR SDRAM, RDRAM, SRAM, etc.), ...”] and intangible embodiments [e.g., transmission media or other suitable media in which logic may be encoded for carrying instructions, See Page 43 ¶1, “...a **carrier medium** may include... transmission media or signals such as electrical, electromagnetic, or digital signals, conveyed via a communication medium such as network and/or a wireless link”. As such, the claim(s) is/are not limited to statutory subject matter and is therefore non-statutory.¹

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 32-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hacherl et al., (USPAT # 5,832,225) hereinafter referred to as Hacherl in view of Parham (USPAT # 7,035,922).

¹ **Note:** all statutory and non statutory medium are “computer readable medium” utilized as a storage medium and/or as a transmission medium (i.e., both are computer usable medium). Having that said, as long as the claim does not specifically claim a computer readable “**storage**” medium, the claim is and will be interpreted to be not limited to a statutory subject matter.

As per claims 32, 46 and 50: Hacherl disclosed (exemplary claim 1) a computer-readable memory medium storing program instructions executable to implement a method (Abstract, Column 7, Lines 53-66, article of manufacture comprising computer readable medium storing therein executable instructions) comprising:

storing a plurality of replicas of an object on each respective node of a plurality of nodes (Fig. 1 and Column 2, Lines 60-66, plurality of server nodes having therein replicas of distributed data objects on each server nodes);

a first node of the plurality of nodes initiating communication with each of the remaining nodes of the plurality of nodes to attempt to synchronously update the plurality of replicas of the object (Abstract, Column 2 Line 60 through Column 3, Line 5, and Column 8, Lines 59-67, “full-mesh replication”), wherein the communication is successful for each node of a first subset of the remaining nodes (Column 8, Lines 11-27 & Lines 59-67, Fig. 2A and Column 9, Lines 17-25, replication of each server within a site (i.e., a first subset of nodes), performing synch of replicas on a full-mesh (meaning that an originating server will synchronously connect with every server within the site) and assuring replication objects across nodes within the site) and unsuccessful for each node of a second subset of the remaining nodes (Column 3, Lines 36-67);

Hacherl substantially disclosed the invention as claimed (i.e., one of the pluralities of server nodes synchronously initiating a communication sessions with all of the plurality of server nodes in an attempt to synchronize replica of objects on each server nodes (“full-mesh replication process”) as recited above. However, Hacherl does not clearly address, for each respective node of the first subset of the remaining nodes: the respective node updating the replica of the object stored on the respective node; and the respective node adding an identification of the object to a respective list of

incoherent objects stored on the respective node in response to the communication being unsuccessful for the second subset of the remaining nodes.

However, in the same field of invention, Parham disclosed a first server node among plurality of server nodes, initiating a communication with each server node in an attempt to synchronize (replicate) a replica object across all server nodes via a “full-mesh replication”, See Below:

In order to keep the data objects maintained by each server current, updates made by one server are "replicated" to all other servers of the database system by a process called "replication." During replication, a "source" server sends data to a "destination" server, and the destination server updates its database with the objects that were modified. The updates being replicated may have originated on the source server or on another server in the system. A server on which a modification to an object is initially made, rather than an update received through a replication, is referred to as an "originating" server. Ultimately, the goal is to replicate an update message to all servers in the system that require updated object information.

Several techniques have been developed to effectuate replication in a network. One such technique is applicable in a simple replicated system, whereby a small number of servers holding the replicated data, referred to as "replicas" or "replica servers," can be directly connected to all servers (or, as an optimization, all read/write (or master) replicas). This technique, referred to as "full-mesh replication," operates in a manner such that as an update is originated on one replica, that replica then sends the update directly to every other replica. See Parham, Column 1, Lines 29-51

Further, Parham disclosed for each respective node of the first subset of the remaining nodes: the respective node updating the replica of the object stored on the respective node; and the respective node adding an identification of the object to a respective list of incoherent objects stored on the respective node in response to the communication being unsuccessful for the second subset

of the remaining nodes (see Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D and Column 7, Line 1 through Column 8, Line 51, each server node in the plurality of server nodes keeping status list of every other server nodes including specific timestamps of successful/unsuccessful replication/synchronization information or a successful attempt (i.e., unsuccessful) of all corresponding nodes).

Thus, it is respectfully submitted that it would have been obvious to one of ordinary skill in the art at the time the invention was made to take the teachings of Parham related to each server nodes maintaining list of coherency of replicas and success information of the replication process of all server nodes and have modified the teachings of Hacherl “for proactively monitoring replica servers to ensure that failures preventing replication are addressed and rectified in a timely and efficient manner” Parham, Column 3, Lines 12-14.

As per claims 33, 47 and 51: The already combined teachings of Parham and Hacherl disclosed that the first node updating the replica of the object stored on the first node; and the first node adding an identification of the object to a respective list of incoherent objects stored on the first node in response to the communication being unsuccessful for the second subset of the remaining nodes (Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D).

As per claims 34, 48 and 52: The already combined teachings of Parham and Hacherl disclosed, wherein initiating the communication with each of the remaining nodes of the plurality of nodes comprises initiating a distributed transaction to attempt to synchronously update the plurality of replicas of the object; wherein each node of the first subset of the remaining nodes successfully commits the transaction and wherein each node of the second subset of the remaining nodes does not successfully commit the transaction (Hacherl Column 8, Lines 11-27 & Lines 59-67, Fig. 2A and

Column 9, Lines 17-25 and Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D).

As per claim 35: The already combined teachings of Parham and Hacherl disclosed, wherein at least a quorum of the plurality of nodes successfully commit the transaction (Hacherl, Column 2 Line 60 through Column 3, Line 5, Column 8, Lines 59-67, and Column 9, Lines 17-25 “full-mesh replication”).

As per claims 36, 49 and 53: The already combined teachings of Parham and Hacherl disclosed, wherein the first subset of the remaining nodes includes a second node of the plurality of nodes (Hacherl Fig. 1, site A having there in plurality of nodes) ; wherein the method implemented by the program instructions further comprises: after the second node adding the object to the respective list of incoherent objects stored on the second node, the second node attempting to communicate with each of the other nodes of the plurality of nodes (Hacherl, Abstract, For each site performing a full-mesh replication insuring all replicas within the site (subset of nodes) are successfully replicated and attempting to replicate further via save and forward replication to remaining plurality of server nodes); in response to successfully communicating with each of the other nodes of the plurality of nodes, the second node initiating a distributed transaction to synchronize the replicas stored on the second subset of the remaining nodes with the replicas stored on the first subset of the remaining nodes (Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D and Column 7, Line 1 through Column 8, Line 51).

As per claim 37: The already combined teachings of Parham and Hacherl disclosed, wherein the method implemented by the program instructions further comprises each respective node of the first subset of the remaining nodes removing the identification of the object from the respective list of incoherent objects stored on the respective node in response to said synchronizing the replicas

stored on the second subset of the remaining nodes with the replicas stored on the first subset of the remaining nodes (Column 9, Lines 40-56 and Column 10, Lines 20-45, and Column 13, Lines 65-67).

As per claim 38: The already combined teachings of Parham and Hacherl disclosed, wherein each respective node of the first subset of the remaining nodes updates the replica of the object stored on the respective node by applying a first change to the replica of the object stored on the respective node (Parham Figs. 5A-6D); wherein synchronizing the replicas stored on the second subset of the remaining nodes with the replicas stored on the first subset of the remaining nodes comprises each respective node of the second subset of the remaining nodes applying the first change to the replica of the object stored on the respective node Hacherl Column 8, Lines 11-27 & Lines 59-67, Fig. 2A and Column 9, Lines 17-25 and Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D).

As per claim 39: The already combined teachings of Parham and Hacherl disclosed, wherein the object is a first object of a plurality of objects, wherein each object of the plurality of objects has a plurality of replicas stored on the plurality of nodes (Hacherl Fig. 1 and Column 2, Lines 60-66, plurality of server nodes having therein replicas of distributed data objects stored on each server nodes); wherein the first subset of the remaining nodes includes a second node (Hacherl Fig. 1, Site A, comprising plurality of server nodes); wherein the respective list of incoherent objects stored on the second node includes identifications of two or more of the plurality of objects Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D); wherein the method implemented by the program instructions further comprises: for each respective object identified in the list of incoherent objects stored on the second node, the second node attempting to communicate with the plurality of replicas of the respective object to initiate a distributed transaction to synchronize the plurality of replicas of the respective object (Parham,

Column 1, Lines 29-51 and Hacherl Abstract, Column 2 Line 60 through Column 3, Line 5, and Column 8, Lines 59-67, “full-mesh replication”).

As per claim 40: The already combined teachings of Parham and Hacherl disclosed, wherein the first subset of the remaining nodes includes a second node (Hacherl Fig. 1, Site A, comprising plurality of server nodes); wherein the method implemented by the program instructions further comprises: the second node periodically attempting to communicate with each of the other nodes of the plurality of nodes (Hacherl Column 12, Lines 27-28); in response to determining that a particular amount of time has passed without successfully communicating with each of the other nodes of the plurality of nodes, the second node initiating an operation to create one or more new replicas of the object (Parham Abstract, Column 2, Lines 27-41, Column 3, Lines 19-61, Column 6, Lines 1-30 & Lines 34-67 Figs. 5A- 6D, Last Successful Replication Timestamp is compared).

As per claim 41: The already combined teachings of Parham and Hacherl disclosed, wherein the first subset of the remaining nodes includes a second node (Hacherl Fig. 1, Site A, comprising plurality of server nodes); wherein the list of incoherent objects stored on the second node is stored in persistent storage of the second node (Parham Column 5, Lines 3-27), Persistent storage of a node utilized); wherein the second node adding the identification of the object to the respective list of incoherent objects stored on the second node comprises: the second node storing information indicating addition of the identification of the object without modifying the list of incoherent objects stored in the persistent storage of the second node (Hacherl, Column 3, Lines 36-67 and Parham Figs. 5A- 6D and Column 7, Line 1 through Column 8, Line 51); after storing the information indicating the addition of the identification of the object, the second node updating the list of incoherent objects stored in the persistent storage of the second node to reflect the addition of the identification of the object (Parham, Column 7, Line 1 through Column 8, Line 51).

As per claim 42: The already combined teachings of Parham and Hacherl disclosed, wherein each respective node updating the replica of the object stored on the respective node comprises each respective node applying a change to the replica of the object stored on the respective node (Hacherl, Column 2, Line 60 through Column 3, Lines 7).

As per claim 43: The already combined teachings of Parham and Hacherl disclosed, wherein the plurality of replicas of the object comprises a plurality of persistent replicas of the object (Hacherl Column 1, Lines 53-67 and Column 3, Lines 44-52).

As per claim 44: The already combined teachings of Parham and Hacherl disclosed, wherein the object is a file; wherein each replica of the object is a replica of the file (Hacherl, Column 2, Lines 60-66 and Parham, Column 1, Lines 29-51).

As per claim 45: The already combined teachings of Parham and Hacherl disclosed, wherein the method implemented by the program instructions further comprises the first node receiving an update message (Column 15 Lines 65-67); wherein the first node initiates the communication with each of the remaining nodes in response to the update message to attempt to synchronously update the plurality of replicas of the object (*See* Parham, Column 1, Lines 29-51 and Hacherl Column 8, Lines 11-27 & Lines 59-67, Fig. 2A and Column 9, Lines 17-25).

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection, which better address the claims as amended.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Doman et al. (US 7072911 B1) entitled: "System and method for incremental replication of changes in a state based distributed database"

b. Brace et al. (US 6457011 B1) entitled: "Method of updating a shared database in a computer network"

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yemane Mesfin whose telephone number is (571)272-3927. The examiner can normally be reached on 9:00AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vaughn William can be reached on 572-272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. M./
Examiner, Art Unit 2144

/William C. Vaughn, Jr./
Supervisory Patent Examiner, Art Unit 2144